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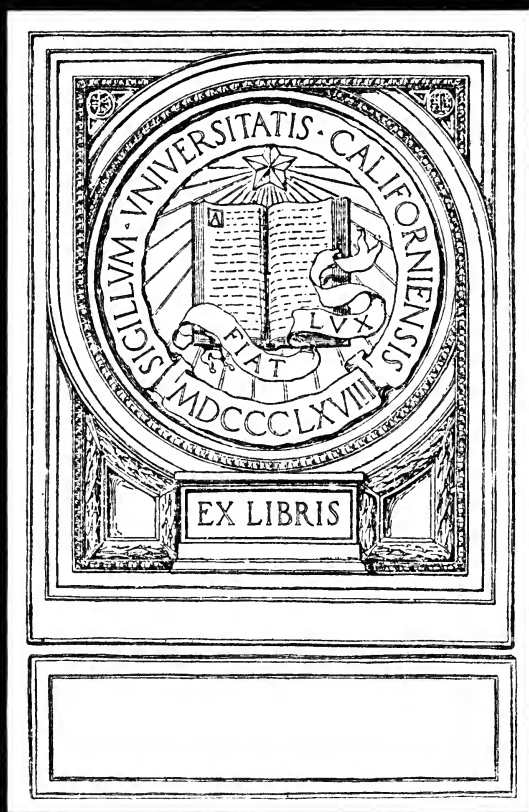
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The Place of Rural Economy in a University Curriculum

AN INAUGURAL LECTURE
DELIVERED AT THE SCHOOLS ON
FEBRUARY 1, 1907

BY
WILLIAM SOMERVILLE
SIBTHORPIAN PROFESSOR OF RURAL ECONOMY

OXFORD
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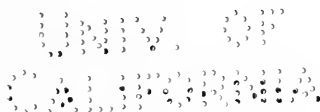
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HENRY FROWDE, M.A.

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THE PLACE OF RURAL ECONOMY IN A UNIVERSITY CURRICULUM

It is a time-honoured custom in this, as in other Universities, for the new occupant of a Chair to be privileged to address those interested in his department on some phase of the subject that has been entrusted to his direction. Naturally he regards the occasion as furnishing a favourable opportunity for reviewing the past, discussing the present, or forecasting the future ; and, guided by the particular circumstances of the case, he attempts to interest his audience in the life and work of the founder, in the historical developments of his subject, or in his own aspirations as to the growth and progress of his department. My own inclinations lead me towards an attempt to outline possible developments in Rural Economy as a subject of instruction and research within this University ; but before doing so it may be well to look backwards and see what has already been done, and outwards, and see what others are doing.

The post which I have the honour to occupy was founded and endowed by Professor Sibthorp in the year 1796. Four years previously a similar post had been created in the University of Edinburgh, and these two Chairs served the wants of the country till 1842, when the Royal Agricultural College was founded at Cirencester. The closing decade of the eighteenth

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century seems to have been a period of active agricultural awakening in more senses than one. Not only did it witness the establishment of the only two University Professorships in Rural Economy that existed prior to 1890, but it was at that time also, namely in 1793, that the Smithfield Club and the Board of Agriculture were established. The former still exists in unimpaired vigour; but the old Board of Agriculture, proving unable to resist the necessity for retrenchment consequent on the Napoleonic wars, was suspended in 1821, to be revived on an enlarged basis in 1889. It is rather unexpected to find that in the year 1800 the then President of the Board of Agriculture appears to have been unaware of the existence of the Sibthorpe Benefaction; for we find him deploring the want of Professors of Agriculture in the Universities of Oxford and Cambridge, and thus expressing himself:—‘Of those educated at each, one-third possibly will have no other employment than to take care of their own estates, and from the want of which early knowledge they are driven to depend on those whose interest it too often is to mislead them. Another third part of our young men educated at universities are allotted to professions in which a knowledge of husbandry would be of infinite utility.’ He quotes Columella to show that even in Roman times ‘every art was taught methodically, whilst that of Agriculture was neglected. And so to this day,’ he goes on to say, ‘the same complaint may, with equal truth, be made. Husbandry should form a more leading part of our education at public schools.’ He was also a strong advocate of a Government experimental farm with an annual subsidy of £500. ‘The establishment of this farm is,’ he says, ‘an essential link in the chain of the future opera-

tions of the Board. . . . I pledge myself that if I may, as an individual, be allowed the honour of interfering in the management of such a farm, it shall, under the blessing of Providence, pay its rent.'

As the end of the eighteenth century witnessed the formal initiation of education in Agriculture, so it was also the period that gave birth to the genuinely scientific literature of the subject. It is true that long before that time Fitzherbert, Tusser, Markham, Blith, Weston, Hartlib, Tull, and others, had described the agricultural conditions of various districts in this and other countries, or had recorded their views on tillages, crops, and stock. But it was reserved for Lord Dundonald to give shape to the idea that was gradually forming in the minds of the philosophers of that period, and to emphasize, once for all, the dependence of agriculture on chemistry. This he did in two works, the one *A Treatise, showing the intimate connexion between Agriculture and Chemistry*, published in 1795; and the other *The Principles of Chemistry applied to the Improvement of Agriculture*, which was issued four years later.

It was in the closing years of the eighteenth century, and the early years of the nineteenth, that two distinguished Englishmen were, each in his own way, doing much to improve the conditions of Agriculture. Arthur Young, the first Secretary of the Board of Agriculture, was mainly responsible for the preparation of the voluminous series of county reports to the Board, which did so much to render general information that had previously been purely local. Largely at Young's instigation the Board of Agriculture invited Sir Humphrey Davy to expound before them the scientific basis of the farmer's business, and this he continued to do

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annually from 1802 to 1812, when he issued the substance of his lectures in the form of a textbook entitled *The Elements of Agricultural Chemistry*. I do not propose to enter on a discussion of Davy's historic work, which did so much to raise the business of agriculture from the slough of empiricism, and to set it on a rational foundation. But I cannot resist pointing out a circumstance that seems to have been strangely overlooked, namely, that Davy anticipated by half a century the experimental demonstration of the fact that leguminous plants are able to draw their nitrogen from the free supplies of that element in the atmosphere. In this connexion he says, 'Peas and beans . . . contain, as appears from analysis, a small quantity of a matter analogous to albumen; but it seems that the azote [the name at that time for nitrogen], which forms a constituent part of this matter, is derived from the atmosphere. The dry bean-leaf, when burned, yields a smell approaching to that of decomposed animal matter; and, in its decay in the soil, may furnish principles capable of becoming a part of the glutin of wheat.' Curiously enough two German investigators, Hellriegel and Wilfarth, are generally credited with this discovery; and yet it is evident that the genius of an Englishman had, sixty years earlier, left but little more to learn¹.

I have occupied a few minutes in reminding you of the position that Agricultural Education and Research occupied in the minds of thinking men about the time that Professor Sibthorp gave practical shape to the views that he held; and the conclusion we are forced to arrive at, it seems to me, is that the subject excited as much interest in the last decade of the eighteenth

¹ Somerville, 'Agricultural Progress in the Nineteenth Century,' *Journ. Bath and West Society*, 1902.

century as it did in the penultimate decade of the nineteenth. In the ninety years that intervene much less was accomplished for Agricultural Science than the activity of the closing ten years of the eighteenth century might have led one to expect. The chief landmarks of this period are the foundation of the Royal Agricultural Society in 1838, and of the Royal Agricultural College in 1842; the commencement of the famous experiments by Lawes and Gilbert at Rothamsted about 1835, and the production by the former of Superphosphate of Lime on a commercial scale in 1843. It is true that each of these factors has had an enormous influence on agricultural production, and the work of Lawes and Gilbert may, in a sense, be called epoch-making; but until 1890 systematic agricultural education could be pursued at only a single University in the United Kingdom. This University was not Oxford but Edinburgh, for although Professorships of Rural Economy were established in these two places about the same time, that at Oxford does not appear to have exercised its functions till 1884, and then only in a very restricted sense. In that year it was detached from the Sherardian Professorship and given an independent though terminable existence, first under Sir Henry Gilbert, and subsequently under Professor Warington.

Almost at the end of the nineteenth century agricultural education in this country stood very nearly where it did a hundred years earlier, and the outlook was about as hopeless as could well be conceived. But seldom has more forcible illustration been given to the saying that the darkest hour is that before the dawn. In the years 1888, 1889, and 1890, three notable events occurred, each of which has had an important influence

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on the question that we are considering. In the first of these years there was presented to Parliament the Final Report of the Departmental Committee on Agricultural and Dairy Schools, presided over by Sir Richard Paget. This Committee pointed out that whereas certain facilities for education in Rural Economy were available at one or two private institutions, where the fees were necessarily high, the requirements of practical farmers were essentially unprovided for. Recognizing the absence of a supply of qualified teachers, they recommended that the work of organizing agricultural education should be undertaken slowly, and suggested that a beginning might be made with five Dairy Schools in England and Wales, and a Normal Central Institution, where skilled teachers might be trained. As a result, £5,000 was placed at the disposal of the Agricultural Department of the Privy Council, of which £1,630 was expended in England and Wales in the year 1888-1889. The money was for the most part distributed over schemes of itinerant instruction, the only collegiate centre to receive a grant being the University College of North Wales.

The second event of importance was the creation in 1889 of the Board of Agriculture, and to it were transferred the functions previously exercised by the Agricultural Department of the Privy Council, including the supervision of Higher Agricultural Education and Research. The Board at once proceeded to develop the policy of encouraging the formation of well-equipped Agricultural Departments in provincial colleges, with which adjoining local authorities could be associated, and to which they could look for the educational machinery necessary to meet their requirements. In pursuance of this policy, grants for schemes

of a restricted and purely local character were gradually abandoned, such work being left in the hands of the County Councils. In the first year the Board granted the sum of £2,160 to thirteen different bodies in England and Wales, and each year has seen some extension of the support, until now the annual sum so administered amounts to nearly £11,000.

The third event to which I wish for a moment to refer occurred in 1890, when the passing of the Local Taxation (Customs and Excise) Act placed at the disposal of County Councils an annual grant approaching a million sterling, all of which was available for the furtherance of technical instruction. The actual sum distributed by the Treasury in any one year depends on the aggregate consumption of whiskey; and as the tendency of recent years has been towards greater sobriety of living, the Exchequer grant has been gradually declining, though it still amounts to the respectable sum of, roughly, £700,000. Of the total amount about an eighth, or say £90,000, is annually spent on education in agriculture in all its branches; so that what with central and local contributions—and neglecting grants from the Board of Education—practically £100,000 a year is at present expended on higher agricultural education in England and Wales, of which nearly half is given to universities and colleges, and to schools of an agricultural character.

Those of us who were at work in the early years of the Technical Education movement have still a vivid recollection of the nervous energy with which Local Authorities applied themselves to the task that was suddenly and unexpectedly thrust upon them. In no case were they equipped with educational machinery; they had practically no precedents to guide them, and an

idea seemed to prevail that if the money was not spent its distribution would be discontinued. Moreover, the Treasury made a point of emphasizing the fact that local authorities must not count on a continuance of the grant. Then again, the Government auditors threatened to surcharge expenditure on experiments, as contrasted with demonstrations, and this set every one asking where the one ended and the other began. There was one way in which the terminological difficulty could be avoided, namely, by making an allocation of funds to a local institution, in which case the Government auditor did not consider that he need inquire into the details of the expenditure. After two or three years had passed without any of the dire results occurring that had been threatened, confidence became established, and the County Councils set themselves to elaborate permanent schemes.

While those who had to administer the Technical Education funds would be the first to admit that the early years of the movement witnessed not a few mistakes, it must, I think, be allowed that most of the County Councils have long since settled down to carry through schemes of sound educational utility. Of the sixty-one County Councils of England and Wales (excluding London), three do nothing whatsoever for agricultural education, fifteen depend entirely upon their county staffs, two have established independent Agricultural Schools, while forty-one are directly associated with Universities, or University Colleges, or with Agricultural Colleges equipped for giving instruction up to a University College standard, or nearly so. Of the Universities of England and Wales, full courses of instruction are provided by Durham, Leeds, Cambridge, London (through the

South-Eastern Agricultural College), and Wales ; while these Universities, and three in Scotland, also grant degrees in Agricultural Science.

Those who have followed the developments in agricultural education of the past sixteen years cannot fail to have noticed the marked change that has come over public opinion during that period. In 1890 a small proportion of farmers were enthusiastic supporters of education and research, and did everything in their power to help forward the work. A considerable number, on the other hand, were definitely hostile, and were active in their advocacy of the diversion of Technical Education funds to the relief of the rates. But the great bulk of agriculturists adopted an attitude of passive indifference, or, at the best, exhibited a languid curiosity as to the manner of man that ventured to offer to instruct them in their business. It is now some years since I have heard of any active opposition on the part of farmers to the provision of technical education in their calling. No doubt one meets with men who are prepared to criticize their county scheme ; but their objections, when closely examined, are usually found to rest essentially on the insufficiency of local funds to provide some particular form of education that would fit directly into their requirements. But of out-and-out denial of the benefits that Education and Science can confer on the business of Agriculture one hears nothing now. On the contrary, there is a large volume of testimony to the advantages that practical men have derived from the facilities for education and scientific inquiry that the Board of Agriculture and local authorities have placed within their reach. A very large number of farmers now look to the local colleges, to the experimental stations, and to the county

staffs, for guidance in the many difficulties that oppose them. They frequently purchase their manures and feeding-stuffs, regulate the feeding of their animals, and lay their plans to guard against or eradicate injurious insects, fungi, and weeds, on the advice of the local experts. Agricultural societies and associations have even been known to pass resolutions of thanks to County Councils for the educational help that has been given to them in their calling, and deputations of agriculturists have waited on the Government to urge them to extend their beneficent operations. Although it is the present generation of farmers who give voice to their appreciation of the advantages that they have derived from the recent educational movement, it is to the rising generation that we must look for solid results. Only in their case has the education been systematic and thorough, and for the most part they have not yet had the opportunity of fully putting into practice what they have learned. Sixteen years ago the number of students pursuing a systematic course of education in scientific agriculture at a collegiate centre in England and Wales could have been little more than 100; while local classes, such as are now a prominent feature of village life, were practically non-existent. In the Report of the Board of Agriculture on the Distribution of Grants for the financial year 1903-4, the number of students who were pursuing a systematic course at one or other of the institutions aided by the Board was put at rather more than 1,000; while the number of those who were reached by short village courses was computed at 22,000. For the year recently closed I estimate the number of internal agricultural students at a central institution at 1,500, and the number of those reached by peripatetic instruction at 32,500.

The increase in the two classes of pupil in the past two years is relatively the same, and amounts to practically 50 per cent. A difficulty in the earlier years was the attracting of students, but the main difficulty now is the finding of accommodation for them. As a consequence, most of the agricultural colleges have had to embark on large building schemes; the South-Eastern College at Wye, for instance—which is affiliated to the University of London—having had twice, within the past five years, to enlarge its premises, until now over 100 men are in residence, and the applications are more numerous than can be entertained. Perhaps the figures that refer to Cambridge may have a special interest for an Oxford audience. In the Michaelmas Term of 1899, when the Agricultural Department was placed on its present basis, the number of students was twenty-five, of whom two were graduates; in 1903 the number was thirty-three, three being graduates; while the present academic year opened with fifty men in the Agricultural Department, of whom fifteen had already taken a degree.

Having briefly reviewed the present position of Higher Agricultural Education throughout the country generally, we may now, perhaps not unprofitably, devote some time to inquiring as to our own attitude in regard to the subject.

If not quite so prompt in taking action in the educational revival of 1890 as one or two other Universities or University Colleges, Oxford cannot be accused of unnecessary delay, for we find that on April 27, 1891, the Hebdomadal Council appointed a Committee of eight (which it subsequently increased to nine) to 'consider in what way the University could assist in the establishment of agricultural education, with a special view to the needs of County Councils'.

Acting under the powers delegated by the Council the Committee at their first meeting on May 6 co-opted eight additional members, and at the same time elected as Chairman the President of St. John's College. So energetically did the Committee deal with the terms of their reference that their Report was presented to the Hebdomadal Council on June 18, having been signed by every member. The recommendations were to the effect that the existing scientific courses should be utilized as the stock on which special agricultural teaching could be engrafted, and that the latter should be provided by the Sibthorpian Professor aided by a technical assistant. The scheme was a very modest one, and was intended to undergo extension and development as students approached the final stage of their training. Regarded from this point of view it would have proved useful as a starting-point, but it may be remarked that the equipment suggested was much more restricted in character than was that of other Universities which were shaping agricultural departments about the same time. Whether the scheme failed to commend itself to the Council because it went too far, or because it did not go far enough, I am not able to say; for us it is sufficient to know that no action was taken upon the recommendations. This, it seems to me, is to be regretted for several reasons. In the first place Oxford has missed the opportunity of training men at a time when the country was specially in need of teachers; and, in the second, the ground has now to a certain extent been occupied, and, especially, public funds have been allocated to institutions that put themselves into line with public requirements, and now such funds appear to be permanently ear-marked or exhausted. There are, however, certain advantages in

a delayed start, and, in any case, the position is not the same to-day as it was in 1891, and must now be treated differently. Finding progress within the University to be difficult or impossible, the friends of Agriculture bethought themselves of associating the University with what was then known as the University Extension College of Reading, in a scheme for organizing instruction and examination in Agriculture. In 1894 Convocation authorized the formation of a Joint Committee comprising representatives appointed by the Delegacy for the Extension of Teaching beyond the University, and by the College at Reading. This Committee was, by subsequent Statutes, passed by Convocation in 1896 and 1904, enlarged to embrace nominees of the Royal Agricultural Society of England and of the Royal Horticultural Society, while its original powers to conduct examinations and grant diplomas in Agriculture were extended to diplomas and certificates in 'Horticulture and other subjects kindred thereto'.

In 1898 the subject was again before the University, when on May 17 a form of statute was promulgated in Congregation, which had for its object the establishment of an Honours School of Agricultural Science. The three avenues proposed to this School were (1) Honours in some other Final School, (2) Honours in the First Public Examination, (3) Passing in Chemistry, Animal Physiology, and Botany in the Preliminary Examinations in the Honours School of Natural Science.

This proposal was chiefly opposed on the grounds (1) that it was in response to a demand from without and not from within, (2) that the University did not provide all the teaching necessary for the School, (3) that certain members of the Board of Studies in charge of the Examinations need not be members of

the University, and (4) that the degree obtained by successful candidates was of the nature of a technical degree. On a vote being taken the preamble was rejected by the narrow majority of forty-seven votes to forty-five.

So far as I am aware this was the last formal attempt to secure for Agriculture a recognized place amongst the subjects of instruction and examination in this University. More recently another Department of Rural Economy, Forestry, has been engaging attention, and for the time being the Sibthorpe Professor has been charged with the duty of giving instruction in Forest Botany. This is, I understand, in fulfilment of a pledge given by the University to the Secretary of State for India, a pledge which the University has been materially assisted to redeem by the generous action of St. John's College. While the matter that is embraced by the term Forest Botany is recognized in most of the Universities and Colleges of Europe as sufficient to employ a man's energies, it would appear to be possible, with reasonable assistance, and with the friendly co-operation of the Sherardian Professor—which I feel sure would not be denied—for the Sibthorpe Professor to find time to direct a vital and active Department of Agriculture, and to take a considerable share in the teaching. Whether there is a desire on the part of the University to revive the question of the organization of agricultural teaching and examination within its walls, I have not attempted directly and specifically to ascertain. But the past history of the movement, and the large measure of support that it secured, would appear to justify the anticipation that interest in the subject could be again quickened into activity. It would appear, too, that

means might be found to remove the more serious objections of those who voted non-placet in 1898, and with some of these objections I personally have considerable sympathy.

Since 1891, when the teaching of Agriculture within the walls of this University was first seriously considered, we have seen created, in the University College of Reading, a Department of Agriculture that is full of vitality and vigour. To a certain extent the Department there occupies ground that would have been covered by this University had it taken action earlier. The Committee of the Hebdomadal Council contemplated in 1891 the supply of courses of instruction suitable to the requirements of the sons of farmers, most of whom, presumably, it was intended to attract from Oxfordshire and contiguous counties. The Department at Reading is now undertaking this work, and probably undertaking it with a larger measure of success than the University could have hoped to achieve. It goes without saying that if the University were now to offer a complete course of instruction in Agriculture, a certain proportion of the students would prove to be the sons of tenant farmers, but probably the actual number would be small. From the point of view of the University, short-course students do not fit quite comfortably into the academic machine ; while, viewed from the standpoint of such students, the greater expense of residence here would act as a deterrent. To educate directly the future cultivators of our English acres is work of the highest importance, but, so far as the rank and file of such men are concerned, the task can be better performed at Reading than in Oxford. Again, if action within the University had followed on the Report of 1891 it is not unlikely, judging by experiences

elsewhere, that the University would have undertaken the performance of local work for adjacent County Councils. Such work consists of courses of lectures at convenient centres, and of demonstration areas or feeding experiments on selected farms. Work of this kind also is interesting and valuable, but it makes serious inroads on a man's time ; and if the energies of a lecturer are divided between local classes and University instruction the latter will suffer relatively most. If, on the other hand, two staffs are maintained, one to deal with internal, and the other with external work, there does not appear to be any great advantage in associating county work with a University Department. Here also the College at Reading has fully met local requirements, and, whatever the future may hold, I do not think that the University need regret the performance of this work by another body.

Having detached these two classes of student, the remainder may also roughly be divided into two groups. One of these is constituted by men whose main business in life will be the management of landed estates. In most cases the land will be the property of the youth whose educational necessities we are considering, while in other cases the relationship will be that of principal and agent. The other group is formed by men who intend to make a profession of teaching, including those who are attracted to the subject as a field for research. The line between these two groups may not be quite sharply defined at all points, but clearly, we have, on the one hand, those who will be engaged in the practice of Agriculture, and on the other, those who intend to follow an academic or, it may be, an official career. There must be young men here who have, practically, no alternative but to assume the responsibilities of

estate management, and there may also be some who would eagerly apply their knowledge of the principles of science, or of economics, or of history, to teaching or research of an agricultural character, if only their attention were turned in that direction. Hitherto this University has, in effect, declared that a sufficient academic course of preparation for the position of a land-owner has been provided along the conventional avenues to a degree. His future work may lead him to till his own fields, to feed his own flocks, to occupy a seat on the County Council, District Council, or Parish Council, or on one or more of the many Committees to which county business is delegated. He may have to make agreements, grant leases, or enter into contracts, and his agricultural operations may at any time bring him up against regulations and orders of Departments of Government. I am far from suggesting that he should be sent forth from the University fitted to dispense with advice legal or administrative, but it would seem reasonable that he should be sufficiently acquainted with the elements of law to appreciate the form and force of a legal instrument such as a farm lease ; that he should have some knowledge of the law and customs that regulate the tenancy of farms, and that he should know how his actions as regards the sale of produce are limited by orders of the Boards of Agriculture and Local Government. He should also be acquainted with the principles of rotations, with the composition and uses of fertilizers and feeding-stuffs, and with the physiological basis of animal and plant nutrition. All this, and much more, he must get to know somehow, if he would rationally direct the management of his estate. What, of course, actually happens in the majority of cases is that the young land-

lord, actual or potential, acquires a fortuitous knowledge of the rudiments of his business, either from observation combined with costly mistakes, or from association with his father or friends. I will not deny that in a considerable number of instances the results are fairly satisfactory, but in any case the process is slow in its operation, and uncertain in its incidence. It goes without saying that class-room and laboratory instruction, however valuable as an enunciation of principles, can never displace experience gained by practice. The University is well fitted to provide the one, but it is powerless to supply the other. This point was clearly recognized and specifically emphasized by the Committee of 1891, whose report contains the following passage :—‘ It is obvious that the everyday manual operations of husbandry, the knowledge of which can only be acquired upon the land itself, are not subjects for University teaching. It is equally obvious that the qualifications on which the successful prosecution of agriculture as a branch of commerce mainly depends, namely practical experience, quickness of observation, knowledge of markets and prices, must be gained elsewhere than at an University.’ Personally I very much question whether there is any compensating advantage in the farmer or owner of a considerable area of land being himself able to perform the ordinary manual processes of agriculture. He can certainly be much more usefully employed than in practising them. It is sometimes objected that a University such as this is no fit place in which to encourage the study of Agriculture, for the reason that this is a technical subject, and that technical study is or should be discouraged. The force of this contention seems to depend on the interpretation that is placed upon the term ‘ technical’. The academic

study of agriculture is not technical in the sense that it is intended to take the place of a training to be pursued in association with the practice of the subject. It cannot, of course, do so. Any one who essayed to farm land, or to manage landed property, on the strength of academic training alone would be likely soon to come to grief. Such a course has, not infrequently, been attempted, and the results have excited the derision of practical men. They have, in fact, supplied material that has brought something approaching contempt on so-called scientific farming, though such operations, being neither accurate nor logical, can lay no claim to be called scientific. It may, however, be granted that the study of the scientific principles of agriculture is technical education, but no more so than is the study of Law, Medicine, Music, or Mechanism. University study does not exempt a prospective solicitor from the necessity of serving as an articled clerk, nor does work in a University Laboratory of Applied Mechanics enable a young engineer to dispense with workshop training. But the Council of Legal Education, and the heads of engineering firms, recognize that a man who has gone through a course of academic training is in a superior position to utilize his subsequent opportunities, and they are prepared to excuse a large part of the period of apprenticeship. Similarly as regards Agriculture. The systematic study of the theory and scientific principles of farming and estate management illuminates subsequent practical processes, and shortens the period of practical training, and to that extent, but only to that extent, it may be called 'technical'.

Again, it is objected that the University study of Agricultural Science entails undesirably early specialization. Whatever force there may be in this objection it

does not seem to me that it can be consistently urged in the University of Oxford, where the regulations that govern the School of Natural Science encourage, and, in fact, demand early specialization of a very pronounced type. Assuming, for a moment, that the proposals brought before Congregation in 1898 were adopted, the Honours School in Agriculture would be supplied with candidates drawn chiefly from two sources. It would receive, in the first place—and perhaps chiefly—men who had passed, in the Honours School of Natural Science, a Preliminary Examination in Chemistry, Animal Physiology, and Botany. Now, at present, a man may take these three subjects in the Preliminary Examination, and, subsequently, he may spend all his time in specializing in Geology, or in Zoology. Whether the course of study in the hypothetical School of Agriculture would be an improvement on this, or the reverse, it is not necessary to inquire, but at least this may be said, that it would be different. A candidate would not be expected to abandon the systematic study of Chemistry; on the contrary, he would be bound to extend such study, which would then embrace the composition and properties of crop and animal products, and of the materials, artificial and natural, that are employed to nourish crops and farm animals. His acquaintance with Animal Physiology would receive economic application in the direction of problems connected with the nutrition and reproduction of domestic animals. He would be called upon to continue his study of Botany in its relation to metabolism in crop-plants, to the economic aspect of the symbiotic association of crops and micro-organisms, to fungal diseases of plants, to improvement of cultivated plants by hybridization, cross-fertilization, and selection, to the

identification, and assessment of worth, of seeds, and to the influence of man's intervention in the struggle for supremacy that is constantly proceeding in our pastures and meadows. To the subjects of his Preliminary Examination he would have to add the study of Zoology, to the extent, at least, of becoming acquainted with the commoner injurious insects, and with their enemies. Nor could he gain a clear insight into the properties and varying characteristics of soils without knowing something of the features and geographical distribution of geological formations, and of the physical and biological agencies that convert them into soil and plant-food. Not to labour the list I may finally mention that the Algebra, Trigonometry, and Geometry of his earlier years would be put to practical use in the computation of volumes and of land areas. Narrow specialization by an undergraduate may or may not be desirable, but in any case the study of Agricultural Science, as recommended for the ordinary student, would hardly appear to be embraced by the conventional meaning of the term. Specialization no doubt comes later, but certainly not within four years of matriculation.

Having said so much in support of the view that it is the duty of a University such as this to provide instruction that will form a suitable introduction to the life-work of a large proportion of its members, I may briefly refer to the importance of agricultural study to another class of student. Since the striking educational developments, to which I have referred, spread throughout the country, the demand for qualified instructors and investigators has been greatly in excess of the supply. In these days, when complaint is heard of fierce competition and over-crowded professions, it is surprising to find that in one calling

at least there is room enough and to spare. This, however, is the state of things that has existed, and exists in full force at the present minute, in the profession of agricultural teacher. In the early nineties, when the Board of Agriculture and Local Authorities were starting their schemes, any man who was reasonably qualified could practically secure a post where he pleased; and although, in the interval, the various Colleges and Agricultural Departments have been turning out many well-trained men, the extension of the educational movement has more than kept pace with the supply of teachers. Ireland, which some ten years ago took up with great energy the improvement of agriculture through the agency of education and organization, has had to draw its teachers almost exclusively from Great Britain. During the past ten years Egypt has frequently taken agricultural lecturers and investigators from this country. More recently the South African Colonies, British East Africa, and the British Territories in West Africa, also some of our West Indian Possessions, have been creating staffs for education, research, and administration; and although the United States has had to be drawn upon, to some extent, the great majority of the men have been taken from this country. During the past three or four years no country has given practical expression to a belief in the advantages of the application of science to agriculture in so marked a degree as British India. Besides the great central research station at Pusa, it has created an agricultural staff in every province, usually associating it with a Provincial College. The Central Station alone has made provision for a staff of nineteen specialists, while the requirements of the Provincial Departments extend to sixty-three. The con-

ditions of service in the Indian Agricultural Department are distinctly attractive, and the regulations have been framed to encourage applications from University graduates. Thus in Regulation 3 it is stated that 'preference is given to distinguished graduates of some University in the British Empire'. That the Government of India have given effect to these declarations is proved by the fact that of the thirty-four technical posts filled since the Department was created, twenty-five have gone to University Graduates, of whom the Agricultural Departments of Cambridge and Edinburgh have supplied sixteen. It need excite no surprise that, with no school of training, Oxford has not supplied a single candidate for these Imperial posts, nor, so far as I can learn, has she fared much better in regard to appointments in the other British possessions and Colonies that I have named. In Ireland and Scotland the result has been the same; only in England has she supplied three workers in Agricultural Science—Chemistry applied to Agriculture in each case—though it must be admitted that these are in the front rank.

The position of affairs, then, is that Oxford is standing aside, and is taking little part in the supply of workers in the field of Agricultural Science at home or abroad. I quite understand that the traditions of the place are on the side of idealism, while the study of Agricultural Science stands unblushingly self-declared as utilitarian. It may be that modern tendencies are wrong, and that Departments of Government and bodies of electors ought to place more confidence in Oxford traditions, and in the inherent worth of conventional study. But facts must be faced as we find them, and the plain fact is that Oxford men are not being sought after for the kind of post that we have been considering. Personally, I should

not advocate a violent breach with the past, and even if reform went no further than the provision of post-graduate instruction of an applied character, the necessities of the case would, to a certain extent, be met. It would, of course, satisfy the requirements of men who, having completed the stage of undergraduate without having discovered a career, might be glad to specialize for a year or more with a view to making a profession of Agricultural Science. There must also be a considerable body of men who would remain in residence after taking a degree, were facilities provided for the prosecution of Agricultural Research under competent direction. And, omitting the word 'degree', the same remark may be applied to women, several of whom have already made no inconsiderable contributions to Agricultural Research. But human nature being what it is, and most individuals having more or less definitely shaped their plans for life by the time they leave school, it is evident that to them the prospects of post-graduate study alone would not appeal with sufficient attractiveness. For them, therefore, an earlier opportunity for study not necessarily of, but in the direction of Agriculture would have to be supplied, such, in fact, as is provided for in the proposals laid before Congregation in 1898. Judging by the experience of other University Departments of Agriculture it might not unreasonably be anticipated that a School of Agriculture in Oxford would, to begin with, receive annually some ten or twelve entrants, and that, within a few years, it might contain a body of students numbering forty to fifty.

A section of undergraduates that must not be overlooked in discussing a scheme for Agricultural Education in Oxford is furnished by the Rhodes Scholars. These men are drawn from countries where, for the most part,

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Agriculture is relatively of more importance than it is at home, and it is not improbable that they would appreciate the opportunity of taking up the study of Agricultural Science, and of becoming acquainted at first hand with English Agriculture, which, after all, has served as a model for the world during the past century or more.

In considering the question of providing ways and means for the education in Rural Economy of Oxford's alumni one fact must not be overlooked, namely, that there exists at Reading an affiliated College, with fully equipped Departments of Agriculture and Horticulture, which is thoroughly qualified to impart applied post-graduate instruction to any reasonable number of Oxford men. I believe I am right in saying that when the Department of Agriculture in that College was formed the hope was cherished that it would be utilized to a considerable extent by Oxford graduates desirous of prosecuting the study of Rural Economy. Had this result been realized, the case for developments within the University, such as I have ventured to suggest, could hardly, with any sense of self-respect, have been considered. But comparison of the names of holders of the Agricultural Diploma of the College with the roll of graduates of this University, has failed to reveal a single name common to the two lists ; while personal inquiry has also failed to discover that any non-graduate of the University has ever taken a recognized course of study or prosecuted research in the Agricultural Department at Reading. Twelve years' trial, therefore, would appear to show that Oxford University life has been practically unaffected by agricultural developments at Reading, and the conclusion would also seem to be justified that no movement within the University is

likely to interfere in any way with the prosperity of that College.

We have considered several of the phases of the agricultural problem as it affects Oxford, but one—and, in some respects, the most important—has been left untouched. I refer, of course, to the question of finance. To set up effective teaching, and to provide facilities for research, would necessitate large initial and annual expenditure. This, however, can hardly be regarded as an appropriate occasion on which to discuss financial ways and means ; but if Oxford can furnish proof that the altered conditions created by the generous action of St. John's College have induced her to revise her verdict of 1898, she need not despair of the State and her friends, private and corporate, rallying to her support.

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